THE WILLIAM STATES LEE COLLEGE OF ENGINEERING

Company Information

Company Name	*Stabilus*	**Date Submitted**	*11/3/2021*
Project Title	*Damper Stroke Speed Tester* **(STAB_STROKE)**	**Planned Starting Semester**	*Spring 2020*

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	3	Electrical	1
Computer	1	Systems	
Other ( )			

Company and Project Overview:

Organization Background

As one of the world's leading providers of gas springs, damping solutions and electromechanical POWERISE drives, Stabilus has demonstrated its motion control expertise for eight decades in the automotive, aerospace, medical, and a host of other sectors. Gas springs, dampers and

electromechanical drives from Stabilus optimize opening, closing, lifting, lowering as well as adjusting actions and protect against vibration. Employing more than 6,200 people worldwide, the company has its operational headquarters in Koblenz, Germany and global annual revenue of over $1 billion. Stabilus operates production plants in nine countries and distributes its products in over 50 countries in Europe, North, Central and South America as well as Asia Pacific via its regional offices and sales partners. Stabilus produces products for the automotive industry from its plant in Gastonia NC.

Project Requirements:

Goal: measure and report the amount of time it takes for a damper to extend or compress under a constant load.

Requirements:

Tester Functions:

- Can test for extension and/or compression time without changing damper orientation
- Extend/Compress Damper with constant programable load: 10N - TBD
- Time measurement resolution: 0.5sec
- Time measurement accuracy: ±0.5sec
- Can export data, print and digital
- Electric 120v prefer – additional hookups permitted (hydraulic / pneumatic)

Display:

- Digital display
- Time for compression: sec
- Time for extension: sec
- Test Stroke: mm
- Test Force: N
- Velocity: mm/s
- Force at speed: N @ mm/s

Test Part Variability:

- Damper Dimensions (rod OD x tube OD): 4x12, 6x15, 8x19, x 8x24, 10x24, 14x28
- Stroke: 20 - 550 mm
- Damper Length: 150 – 1150 mm
- Connection Types:
  - Ball studs: 8mm, 10mm, 13mm, 16mm
  - Blade / Spherical Rod Ends
  - Threaded End Fittings (Threads only): M4-M14

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Physical Requirements:

Must be able to test dampers vertically and horizontally
Can be a tabletop or stand-alone unit
Must fit in an envelope
Width: 4ft
Depth: 3ft
Height: 7ft

Expected Deliverables/Results:

- Test rig as defined above
- Complete drawing and BOM for the test rig
- Maintenance instructions
- Operational instructions including a video
- All code for the User Interface
- Testing completed and documented for all product types

Disposition of Deliverables at the End of the Project:

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Interest is control and feedback design
- Ability to travel to Stabilus as required